The invention claimed is:

1. A method for actively aligning components of an arrayed optical fiber collimator, the method comprising the steps of:

(a) providing a first fixture for receiving and retaining an optical fiber array block, the optical fiber array block receiving and retaining a plurality of individual optical fibers;

(b) providing a second fixture for receiving and retaining a microlens array substrate, the microlens array substrate including a plurality of microlenses integrated along a microlens surface and a substrate surface opposite the microlens surface;

(c) providing a third fixture for receiving and retaining at least a portion of a first light receiver, wherein the first light receiver is positioned to receive a light beam from at least one of the integrated microlenses;

(d) providing at least one light beam from a light source to at least one of the plurality of individual optical fibers;

(e) adjusting the position of at least one of the microlens array substrate and the optical fiber array block in relation to each other to maximize the optical power of the light beam received by the first light receiver; and

(f) fixing the optical fiber array block to the microlens array substrate when the optical power provided by the integrated microlens is at a maximum, wherein a finished arrayed optical fiber collimator is provided.

2. The method of claim 1, wherein the first light receiver includes a single-mode collimated fiber that is coupled to a detector at one end, and wherein another end of the single-mode collimated fiber is positioned to receive a light beam from one of the integrated microlenses, where the optical fiber array block is fixed to the microlens array substrate when the optical power provided to the detector is at a maximum.

3. The method of claim 2, further including the step of:

replacing the single-mode collimated fiber with the finished arrayed optical fiber collimator and repeating steps (a) through (f).

4. The method of claim 1, further including the steps of:

providing a half-mirror between the first light receiver and the microlens array substrate, wherein the half-mirror is aligned in parallel to the optical fiber array block, the half-mirror partially reflecting the light beam when the light beam is at a desired wavelength;

providing one of an optical coupler and an optical circulator coupled between the light source and the optical fiber array block, wherein one of the optical coupler and the optical circulator are coupled to at least one of the plurality of individual optical fibers; and

providing a second light receiver coupled to an output port of one of the optical circulator and the optical coupler, where the optical fiber array block is fixed to the microlens array substrate when the optical power provided to the second light receiver is at a maximum.

5. The method of claim 4, wherein the first light receiver is a charge coupled device (CCD) camera.

6. The method of claim 4, wherein the half-mirror is positioned at an optical beam waist point of the integrated microlenses.

7. The method of claim 1, further including the steps of:

attaching a dummy block to the microlens array substrate, the dummy block partially reflecting the light beam;

providing one of an optical coupler and an optical circulator coupled between the light source and the optical fiber array block, wherein one of the optical coupler and the optical circulator are coupled to at least one of the plurality of individual optical fibers; and

providing a second light receiver coupled to an output port of one of the optical circulator and the optical coupler, where the optical fiber array block is fixed to the microlens array substrate when the optical power provided to the second light receiver is at a maximum.

8. The method of claim 7, wherein the first light receiver is a charge coupled device (CCD) camera.

9. The method of claim 7, wherein the dummy block is made of one of $SiO_2$ and glass.

10. The method of claim 1, wherein the plurality of individual optical fibers includes a first optical fiber and a last optical fiber, and wherein a light beam is provided to both the first and last optical fibers to facilitate alignment.

11. The method of claim 10, wherein at least one other optical fiber is positioned between the first optical fiber and the last optical fiber.

12. The method of claim 7, wherein the dummy block is attached to the substrate surface of the microlens array substrate.

13. The method of claim 7, wherein the dummy block is attached to the microlens surface of the microlens array substrate.

14. The method of claim 13, wherein the dummy block includes a first surface that is attached to the microlens surface and a second surface, and wherein the microlenses are one of refractive lenses and diffractive lenses and the dummy block is configured to provide an air gap between the microlens surface and the first surface.

15. The method of claim 13, wherein the dummy block includes a first surface that is attached to the microlens surface and a second surface, and wherein the microlenses are graded-index (GRIN) lenses and the second surface of the dummy block is slanted.

16. The method of claim 1, wherein the first, second and third fixtures are coupled to an auto-aligner for facilitating movement of the optical fiber array block and the microlens array substrate with respect to the light receiver along three orthogonal axes.

17. The method of claim 1, wherein the microlenses are one of graded-index (GRIN) lenses, refractive lenses and diffractive lenses.

18. A system for actively aligning components of an arrayed optical fiber collimator, the system comprising:

an auto-aligner;

a first fixture for receiving, retaining and coupling an optical fiber array block to the auto-aligner, the optical fiber array block receiving and retaining a plurality of individual optical fibers;

a second fixture for receiving, retaining and coupling a microlens array substrate to the auto-aligner, the microlens array substrate including a plurality of microlenses integrated along a microlens surface and a substrate surface opposite the microlens surface;

a third fixture for receiving, retaining and coupling at least a portion of a first light receiver to the auto-aligner, wherein the first light receiver is positioned to receive a light beam from at least one of the integrated microlenses; and

a light source providing at least one light beam to at least one of the plurality of individual optical fibers, wherein the auto-aligner adjusts the position of at least one of the microlens array substrate and the optical fiber array block in relation to each other to maximize the optical power of the light beam received by the first light receiver, and wherein the optical fiber array block is fixed to the microlens array substrate when the optical power provided by the integrated microlens is at a maximum, thereby providing a finished arrayed optical fiber collimator.

19. The system of claim 18, wherein the first light receiver includes a single-mode collimated fiber that is coupled to a detector at one end, and wherein another end of the single-mode collimated fiber is positioned to receive a light beam from one of the

integrated microlenses, where the optical fiber array block is fixed to the microlens array substrate when the optical power provided to the detector is at a maximum.

20. The system of claim 19, wherein the single-mode collimated fiber is replaced with the finished arrayed optical fiber collimator which is then used to couple another light beam to the detector for aligning a next arrayed optical fiber collimator.

21. The system of claim 18, further including:

a fourth fixture for receiving and retaining a half-mirror coupled to the auto-aligner, the half-mirror being provided between the first light receiver and the microlens array substrate, wherein the half-mirror is aligned in parallel to the optical fiber array block, the half-mirror partially reflecting the light beam when the light beam is at a desired wavelength;

one of an optical coupler and an optical circulator coupled between the light source and the optical fiber array block, wherein one of the optical coupler and the optical circulator are coupled to at least one of the plurality of individual optical fibers; and

a second light receiver coupled to an output port of one of the optical circulator and the optical coupler, wherein the optical fiber array block is fixed to the microlens array substrate when the optical power provided to the second light receiver is at a maximum.

22. The system of claim 21, wherein the first light receiver is a charge coupled device (CCD) camera.

23. The system of claim 21, wherein the half-mirror is positioned at an optical beam waist point of the integrated microlenses.

24. The system of claim 18, further including:

a dummy block attached to the microlens array substrate, the dummy block partially reflecting the light beam;

one of an optical coupler and an optical circulator coupled between the light source and the optical fiber array block, wherein one of the optical coupler and the optical circulator are coupled to at least one of the plurality of individual optical fibers; and

a second light receiver coupled to an output port of one of the optical circulator and the optical coupler, wherein the optical fiber array block is fixed to the microlens array substrate when the optical power provided to the second light receiver is at a maximum.

25. The system of claim 24, wherein the first light receiver is a charge coupled device (CCD) camera.

26. The system of claim 24, wherein the dummy block is made of one of $SiO_2$ and glass.

27. The system of claim 18, wherein the plurality of individual optical fibers includes a first optical fiber and a last optical fiber, and wherein a light beam is provided to both the first and last optical fibers to facilitate alignment.

28. The system of claim 27, wherein at least one other optical fiber is positioned between the first optical fiber and the last optical fiber.

29. The system of claim 24, wherein the dummy block is attached to the substrate surface of the microlens array substrate.

30. The system of claim 24, wherein the dummy block is attached to the microlens surface of the microlens array substrate.

31. The system of claim 30, wherein the dummy block includes a first surface that is attached to the microlens surface and a second surface, and wherein the microlenses are one of refractive lenses and diffractive lenses and the dummy block is configured to provide an air gap between the microlens surface and the first surface.

32. The system of claim 30, wherein the dummy block includes a first surface that is attached to the microlens surface and a second surface, and wherein the microlenses are graded-index (GRIN) lenses and the second surface of the dummy block is slanted.

33. The system of claim 24, wherein the microlenses are one of graded-index (GRIN) lenses, refractive lenses and diffractive lenses.

34. A method for actively aligning components of an arrayed optical fiber collimator, the method comprising the steps of:

(a) receiving and retaining an optical fiber array block including a plurality of individual optical fibers;

(b) receiving and retaining a microlens array substrate including a plurality of microlenses integrated along a microlens surface and a substrate surface opposite the microlens surface;

(c) receiving and retaining at least a portion of a first light receiver, wherein the first light receiver is positioned to receive a light beam from at least one of the integrated microlenses and includes a single-mode collimated fiber that is coupled to a detector at one end, and wherein another end of the single-mode collimated fiber is positioned to receive a light beam from one of the integrated microlenses;

(d) providing at least one light beam from a light source to at least one of the plurality of individual optical fibers;

(e) adjusting the position of at least one of the microlens array substrate and the optical fiber array block in relation to each other to maximize the optical power of the light beam received by the first light receiver;

(f) fixing the optical fiber array block to the microlens array substrate when the optical power provided to the detector is at a maximum, wherein a finished arrayed optical fiber collimator is provided; and

(g) replacing the single-mode collimated fiber with the finished arrayed optical fiber collimator and repeating steps (a) through (f).

35. A method for actively aligning components of an arrayed optical fiber collimator, the method comprising the steps of:

(a) providing a first fixture for receiving and retaining an optical fiber array block, the optical fiber array block receiving and retaining a plurality of individual optical fibers;

(b) providing a second fixture for receiving and retaining a microlens array substrate, the microlens array substrate including a plurality of microlenses integrated along a microlens surface and a substrate surface opposite the microlens surface;

(c) providing a third fixture for receiving and retaining at least a portion of a first light receiver, wherein the first light receiver is positioned to receive a light beam from at least one of the integrated microlenses;

(d) providing at least one light beam from a light source to at least one of the plurality of individual optical fibers;

(e) providing a half-mirror between the first light receiver and the microlens array substrate, wherein the half-mirror is aligned in parallel to the optical fiber array block, the half-mirror partially reflecting the light beam when the light beam is at a desired wavelength;

(f) providing one of an optical coupler and an optical circulator coupled between the light source and the optical fiber array block, wherein one of the optical coupler and the optical circulator are coupled to at least one of the plurality of individual optical fibers;

(g) providing a second light receiver coupled to an output port of one of the optical circulator and the optical coupler;

(h) initially adjusting the position of at least one of the microlens array substrate and the optical fiber array block in relation to each other to maximize the optical power of the light beam received by the first light receiver;

and

(i) fixing the optical fiber array block to the microlens array substrate when the optical power provided to the second light receiver is at a maximum, wherein a finished arrayed optical fiber collimator is provided.

36. The method of claim 35, wherein the first light receiver is a charge coupled device (CCD) camera.

37. The method of claim 35, wherein the half-mirror is positioned at an optical beam waist point of the integrated microlenses.

38. A method for actively aligning components of an arrayed optical fiber collimator, the method comprising the steps of:

(a) providing a first fixture for receiving and retaining an optical fiber array block, the optical fiber array block receiving and retaining a plurality of individual optical fibers;

(b) providing a second fixture for receiving and retaining a microlens array substrate, the microlens array substrate including a plurality of microlenses integrated along a microlens surface and a substrate surface opposite the microlens surface;

(c) providing a third fixture for receiving and retaining at least a portion of a first light receiver, wherein the first light receiver is positioned to receive a light beam from at least one of the integrated microlenses;

(d) providing at least one light beam from a light source to at least one of the plurality of individual optical fibers;

(e) attaching a dummy block to the microlens array substrate, the dummy block partially reflecting the light beam;

(f) providing one of an optical coupler and an optical circulator coupled between the light source and the optical fiber array block, wherein one of the optical coupler and the optical circulator are coupled to at least one of the plurality of individual optical fibers;

(g) providing a second light receiver coupled to an output port of one of the optical circulator and the optical coupler;

(h) initially adjusting the position of at least one of the microlens array substrate and the optical fiber array block in relation to each other to maximize the optical power of the light beam received by the first light receiver; and

(i) fixing the optical fiber array block to the microlens array substrate when the optical power provided to the second light receiver is at a maximum, wherein a finished arrayed optical fiber collimator is provided.

39. The method of claim 38, wherein the first light receiver is a charge coupled device (CCD) camera.

40. The method of claim 38, wherein the dummy block is made of $SiO_2$or glass.